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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,894	11/26/2003	Prathyusha K. Salla	132958XX-C/YOD GEMS:0263	1160
7590 Patrick S. Yoder FLETCHER YODER P. O. Box 692289 Houston, TX 77269-2289			EXAMINER MEHTA, PARIKHA SOLANKI	
			ART UNIT 3737	PAPER NUMBER
			MAIL DATE 06/20/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/723,894	Applicant(s) SALLA ET AL.	
	Examiner Parikha S. Mehta	Art Unit 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see "Remarks" pp. 23-24, filed 23 February 2007, with respect to the substantial duplicate objections to claims 1-32 have been fully considered and are persuasive. The previous objection to claims 1-32 as being substantial duplicates of co-pending claims is hereby withdrawn.
2. Applicant expressly chooses to defer response to the previously established double patenting rejection of claims 1-32 ("Remarks", p. 22). Applicant cites the intention of responding if and when either of the instant and conflicting applications is granted a patent. Since the Applicant has not filed a Terminal Disclaimer or otherwise provided sufficiently persuasive arguments effective to overcome the previous double patenting rejection of claims 1-32, the rejections must be maintained and are reiterated below.
3. Applicant's amendments to claims 1, 2, 9, 10, 17, 18, 25 and 26 are sufficient to render the claimed subject matter statutory. Accordingly, the previous rejection of claims 1, 2, 9, 10, 17, 18, 25, and 26 under 35 U.S.C. 101 is hereby withdrawn.
4. Applicant's corrections to the specification are sufficient to overcome Examiner's previous objection. Accordingly, the previous objection to the specification is hereby withdrawn.
5. Applicant's arguments filed 23 February 2007 with regards to the rejection of claims 1-32 under 35 U.S.C. 102 and 35 U.S.C. 103 have been fully considered but they are not persuasive. Applicant argues that the applied Larson reference (US PG Pubs. No. 2004/0155653) fails to teach acquisition of motion data using electrical sensors. Applicant argues that the imaging system of Larson ('653) fails to constitute an electrical sensor as claimed in the instant application, and cites passages of the specification in support of this argument. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. Therefore, since any MR imaging system is necessarily electrical and also must include a sensor to detect the image signal, Examiner maintains that the MR imaging of Larson ('653) does in fact constitute sensor-based motion measurement as claimed in the instant application.

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Applicant contends that Examiner has incorrectly equated the start and end times of a breath hold with the claimed retrospective gating points. While Examiner agrees with Applicant that numerous retrospective gating points exist over one breath hold, Examiner specifically cited the start and end of the breath hold as taught by the Larson ('653) reference as being two potential gating points that directly read upon the "two or more retrospective gating points" claimed in the instant application.

Applicant further argues that the applied references fail to teach the acquisition of motion data for two or more organs. In the previous Office Action, Examiner stated that "Larson ('653) discloses a method and system for gated cardiac MR imaging in which the images are synchronized to the beating of the heart the respiration of the lungs, equivalent to the two or more organs claimed in the instant application." More specifically, "the lungs" as taught by Larson ('653) reasonably constitute the claimed two or more organs. Alternatively, Larson ('653) discloses that "both cardiac respiratory timing information may typically be extracted from the same MR imaging data" (§ [0062]), which would constitute acquisition of motion data for two or more organs in view of Examiner's previous assertion that the data of Larson ('653) constitutes both image and motion data as claimed in the instant application.

Applicant contends that the previous rejections of claims 5, 6, 14, 14, 21, 22, 29 and 30 do not sufficiently address Applicant's invocation of 35 U.S.C. 112 paragraph 6, and that "Applicant has not been afforded an opportunity to respond to a proper rejection of these claims" (Remarks, p. 28). Examiner respectfully directs Applicant's attention to the following excerpt from MPEP sections 2181 and 2183, respectively:

"Per our holding, the "broadest reasonable interpretation" that an examiner may give means-plus-function language is that statutorily mandated in paragraph six. Accordingly, the PTO may not disregard the structure disclosed in the specification corresponding to such language when rendering a patentability determination."

"If the examiner finds that a prior art element
(A) performs the function specified in the claim,
(B) is not excluded by any explicit definition provided in the specification for an equivalent, and
(C) is an equivalent of the means- (or step-) plus-function limitation,
the examiner should provide an explanation and rationale in the Office action as to why the prior art element is an equivalent."

Additionally, the sixth paragraph of 35 U.S.C. 112 reads as follows:

"An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof."

In summary, the MPEP states that the Examiner is required to consider a means-plus-function claim in the context of the scope set forth in the specification of the instant application. Examiner maintains that the previous rejections of claims 5, 6, 13, 14, 21, 22, 29 and 30 sufficiently satisfy this requirement, as the art cited by the Examiner teaches all limitations of the claimed invention as described in the instant specification. For example, with regards to claim 5, Examiner presented evidence to show that Larson ('653) discloses an imaging system capable of obtaining simultaneous motion and image data, and also capable of reconstructing/processing the image and motion data (Figs. 1, 6 & 7, Abstract, ¶ [0010], ¶ [0042], ¶ [0044]). One of reasonable skill in the art would consider these elements to directly read upon the claimed (1) means for acquiring image data, (2) means for acquiring motion data concurrent with the motion data, (3) means for processing the motion data to extract the retrospective gating points and (4) means for processing the image data based on the gating points, respectively. Similar arguments were made in regards for claims 6, 13, 14, 21, 22, and 29. Furthermore, the prior art elements (a) were shown to perform the function specified in the claims, (b) were not excluded by any explicit definition provided in the instant specification for an equivalent, and (c) are equivalent to the means-plus-function limitation as disclosed by the Applicant. As such, the previous rejections of claims 5, 6, 13, 14, 21, 22, 29 and 30 are in fact sufficient, and are maintained as set forth in the prior Office Action with additional modifications necessitated by Applicant's claim amendments.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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7. Claims 1-16 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-8 and 17-24 of copending Application No. 10/723,857. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the instant application are merely broader than those of the co-pending application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

8. Claims 17-32 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 17-32 of copending Application No. 10/723,857, in view of Rogers (US Patent No. 5,477,144). Although the conflicting claims are not identical, they are not patentably distinct from each other. Claims 17-32 of the co-pending application disclose all limitations of claims 17-32 of the present invention, with the exception of specifying that the imager is an MR system and that the non-electrical sensor(s) is used to acquire cardiac motion data. In the same field of endeavor, Rogers ('144) teaches a system and method for retrospectively-gated cardiac MR imaging, using non-electrical sensors to acquire cardiac motion data (col. 5 lines 53-63). It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system and methods of the co-pending application to employ an MR imager and non-electrical cardiac sensors, in order to eliminate interference between the magnetic field and the sensors, in view of the teachings of Rogers ('144).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1-8 and 25-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Larson (US PG Pubs. No. 2004/0155653). Larson ('653) discloses a method and system for gated cardiac MR imaging in

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which the images are synchronized to the beating of the heart or respiration of the lungs, equivalent to the two or more organs claimed in the instant application, wherein the image data and motion data are acquired substantially simultaneously (Figs. 1, 6 & 7, Abstract, ¶ [0044]). Larson ('653) states that the imaging data may be retrospectively synchronized to the cardiac motion data, and that the method may be performed over a single breath hold (¶ [0010], (¶ [0051], Fig. 6). The MR imaging data of Larson ('653) is equivalent to both the image data and motion data claimed in the method and system of the instant application (¶ [0010]). The MR imaging system disclosed by Larson ('653) is equivalent to an electrical sensor, and the start and end times of the single breath hold are equivalent to the two retrospective gating points (¶ [0010]). Larson ('653) further discloses steps for reconstructing the image data from raw k-space data (¶ [0042]). Larson ('653) also states that "the extracted timing information may be processed to provide temporal correspondence with the motion... [t]he processing may comprise extracting a peak, phase, or rate of a time-varying signal" (¶ [0018]). Since the processed timing information is subsequently used to process the image data of Larson ('653), the peak, phase, and rate of a time-varying signal of the reference invention constitute motion compensation factors as claimed in the instant application.

Regarding the computer program and MR imaging system claimed in the instant application, Larson ('653) discloses using a conventional MR system to perform the retrospective cardiac image gating method (¶ [0053]). It is known that, in the state of the art at the time of invention, a conventional MR system included an imager, data acquisition circuitry for acquiring and processing motion image signals, system control circuitry for operating the imager, an operator workstation for communicating with the system control circuitry, a sensor-based motion measurement system as claimed in the instant application, and computer programs including routines for operating all of the above-noted components.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 9-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larson (US PG Pubs. No. 2004/0155653) in view of Rogers (US Patent No. 5,477,144). Larson ('653) teaches all features of

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the present invention as described above in paragraph 7 of the instant Office Action. Larson ('653) further teaches that cardiac motion image data may be synchronized with respiratory motion data (§ [0063]). Larson ('653) does not provide non-electrical sensors for acquiring the cardiac motion image data.

In the same field of endeavor, Rogers ('144) provides a method and system for retrospectively-gated cardiac MR imaging with motion artifact correction, including the synchronization of respiratory motion data with cardiac motion data, as acquired by a pressure transducer, an acoustic microphone, a piezoelectric crystal transducer, all of which are non-electrical (col. 5 lines 53-63). Larson ('653) teaches that the use of cardiac motion sensors other than an ECG during imaging is desirable, because it avoids the problem of interference between the cardiac motion sensors and the magnetic field of the MR imaging system (§ [0003], § [0013]). In light of the motivation provided by Larson ('653), it would have been obvious to one of ordinary skill in the art at the time of invention to modify the method and system of Larson ('653) to employ the non-electrical cardiac motion sensors provided by Rogers ('144).

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Epstein et al (US Patent No. 5,997,883), Spraggins et al (US Patent No. 4,961,426), Stergiopoulos et al (US PG Pubs. No. 2004/0102695) and Hedlund et al (US PG Pubs. No. 2002/015671) teach related methods and systems for acquiring and gating cardiac MR data to correct for organ motion artifact.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

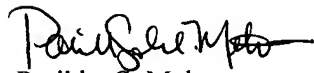
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parikha S. Mehta whose telephone number is 571.272.3248. The examiner can normally be reached on M-F, 8 - 4:30pm.

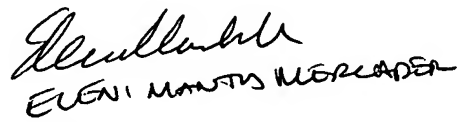
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571.272.4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Parikha S. Mehta

Examiner – Art Unit 3737



EUGEN MANTIS MERLADEN
SPE 3768